Pink Disease

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THE first account of this disease was published in 1903 by Selter of Solengin, who called it trophodermatoneurosis, but not until Dr. Swift of Australia described it was it recognised as a clinical entity. Since then numerous descriptions have appeared, including that of Feer, a German pædiatrician. Several names are still current, e.g., erythrœdema, acrodynia, dermato-polyneuritis, while in Germany the condition is known as Selter-Swift-Feer's disease.

Cases of pink disease are being observed with increasing frequency in Northern Ireland, or perhaps one should say, more frequently recognised and not diagnosed as cases of vague rickets or teething disorders.

The clinical picture is as follows : a child of six months to two years old has become gradually fretful and miserable and refuses food. Insomnia is marked, there is hypotonia of muscles and the mother may offer the information that "the baby's head has become loose." At some stage there appears a fine papulo-vesicular red rash either preceded or followed by marked redness of feet and hands, which remain cold. The tip of the nose is often red, which may be due to the fact that the child burrows into its pillow because of intense photophobia.

The following description of the disease is based on a series of twenty cases admitted to the medical ward of the Belfast Hospital for Sick Children during the period 1933-38.

OCCUPATIONAL AND GEOGRAPHICAL DISTRIBUTION.

There is no definite evidence that the social position or district of residence in the series bears any relation to the incidence of the disease. Seven of the cases were of the labouring or unemployed class, while thirteen were of families of good average class; séven were country children, and thirteen from towns.

From the series of cases under discussion there appears to be a slight increase in cases in the months of April, May, and November; this rise has been noticed by Feer and Rocaz, but as yet its significance is not clearly understood. On the other hand one notices that the disease is rarer in the summer months June to September, which rather suggests that cold wet weather may be an etiological factor.

Age and Sex.—The youngest case observed was a female infant aged three months, and the oldest a male aged two and a half years, the average age over the series was eight months, but cases have been recorded up to the age of fourteen years. A predominance in male children was noted, there being fifteen males and five females.

Family History.—This is of no apparent value in diagnosis, as the cases seen ranged from first-born to seventh.

Etiology.—Two theories as regards the etiology of pink disease are put forward by writers on the subject, but as yet no definite conclusion has been recorded. A

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vitamin deficiency has been suggested, but the evidence is not conclusive as no constant dietetic deficiency has been so far discovered, and breast- and bottle-fed children are equally affected. Moreover the supply of all known vitamins fails to promote a cure.

The other thing is, that it is a virus infection, analogous to the causative agent of epidemic encephalitis, of a neurotrophic nature attacking the vegetative nervous system; this idea is strongly held by the French and German writers. To quote Rocaz: "the facts are extremely suggestive that pink disease is an inflammation of the nervous system and bears an intimate relationship to epidemic encephalitis."

Pathology.

Owing to the fact that the majority of cases of pink disease recover, the autopsies are few, and as the nervous symptoms have been but recently recognised, the detailed pathology of the nervous system has been investigated in only about five cases. The best recognised account is that of Paterson and Greenfield, who found diffuse cellular infiltration in the grey matter of the lumbar cord, the peripheral nerves showing similar changes with complete demyelination of nerve fibres; along with this they describe changes in the basal ganglia, oblongata nuclei, and cell chromatolysis on the floor of fourth ventricle, in lenticular nucleus, and the thalmus. Another notable feature was the presence of perivascular cuffing round the vessels and capillaries. That is, the changes found have been of a purely degenerative nature suggestive of a "toxic change on an infectious basis." (Freer).

Symptoms.

Onset.—The onset is insidious, vague symptoms of nasal catarrh and anorexia gradually develop into the complete clinical picture. The symptoms will be described according to the system affected.

Nervous System.—The first thing the mother may notice is the gradual onset of irritability and restlessness associated with insomnia and an increasing look of misery in the child. Sensory symptoms are difficult to investigate in infants, but the presence of irritation is evident from the restlessness, constant scratching, and gnawing of the body and extremities, and the resentment shown to lifting or moving. Some writers have described objective sensory changes in their older patients, e.g., hyperæsthesia and paræsthesia; one older child complained of sensations in limbs "like needles."

Tendon reflexes may be diminished or even absent in the more severe cases, in moderate cases little change is found.

Trophic changes are an essential feature in severe or advanced cases, e.g., loss of hair, falling out of teeth, necrosis or whitlows of fingers are all described, the latter occurring in one case of the present series.

Photophobia, when present, is characteristic; the child keeps its eyes tightly shut and lies in bed with its face buried in the pillow—"burrows"; no abnormality of retinæ is found, occasionally a mild conjuctivitis is present.

Soon after the onset, hypotonia and general softness of the muscles is noted; in the case of the child of two and a half years the gradual inability to walk was the

first symptom noticed. As the disease progresses the child ceases to try to sit up in bed, or when it does, the head falls forward or to the side; he may even lie on his abdomen or in a crouched position for weeks. In babies the mouth hangs open, characteristically described as "gosling mouth."

Occasionally a lumbar puncture is performed owing to the fact that meningismus with head retraction is sometimes seen; the fluid is usually found to be normal. Rocaz describes several cases where this meningismus was associated with a slight increase in cells, the highest recorded being 10/c.m.m.

Cutaneous Symptoms.—There is profuse sweating. Early in the disease a rash of papulo-vesicular erythematous nature usually occurs, and there is characteristic pinkness of feet, hands, and nose, which may show signs of desquamation. The extremities are constantly cold and often œdematous.

There is a tendency for the hair and teeth, if present, to fall out, and necrosis of fingers may be seen, while the liability to secondary sepsis is a complication for which observation should be made.

Digestive Symptoms.—The mouth occasionally shows a stomatitis which may become very severe. Anorexia is constant, with gradual loss of weight, the bowels tend to be constipated; this was recorded in ten cases of the series; occasionally slight diarrhœa may occur. Children over two years of age have been known to complain of colicky abdominal pains as is described by Feer.

Respiratory Symptoms.—At the onset of pink disease there is marked rhinorrhœa occasionally accompanied by mild bronchitis. Later a severe bronchitis or pneumonia may develop and may prove fatal.

Urinary Symptoms.—Not infrequently albuminuria with or without bacteriuria is found accompanied by marked pyrexia. Three cases of this were found in this series.

Circulatory Symptoms.—Tachycardia with slight increase in the systolic blood pressure is described by most writers and is apparently a fairly constant feature. Cyanotic attacks and true gangrene has been described by Feer. The blood, if examined, may show a slight leucocytosis and polycythæmia, the latter being due to dehydration from the intense perspiration. Continental writers also stress the fact that the blood calcium is often increased to 11-12 mg. per cent. with a low inorganic phosphorus content, the chloride remaining normal.

General Condition.—The most marked feature is the gradual deterioration of the child with wasting, associated with its very dejected appearance; a mild pyrexia may be present throughout, which often makes one suspect abdominal tuberculosis. Once convalescence occurs the uphill course is strikingly progressive.

TABLE OF FIRST SYMPTOMS.

	Cases	*Percentage*
Irritability	6	30
*Rash	4	20
Rhinorrhœa	3	15
Anorexia	2	10

Loss of weight	2	10
Mild bronchitis	1	5
Hypotonia	1	5
Cold feet and hands	1	5

* With regards to this, one has to distinguish between the primary erythematous papulo-vesicular rash (recorded above), followed by desquamation of skin of hands and feet, and the pinkness of these which is marked later on in the disease.

INCIDENCE OF SYMPTOMS.

	Cases	*Percentage*
Irritability	20	100
Pink feet and hands	20	100
Cold feet and hands	20	100
Anorexia	16	80
Loss of weight	15	75
Pyrexia	15	75
Rash	14	70
Hypotonia	14	70
Restlessness	13	65
Sweating	11	55
Sleeplessness	9	45
Rhinorrhœa	6	30
Bronchitis	6	30
Photophobia	6	30
Miserable appearance	6	30
Meningism	2	10
Coincident rickets	5	25
Coincident B. Coli infection of urine ...	4	20

THREE SHORT CLINICAL RECORDS OF CASES SEEN IN THE BELFAST HOSPITAL FOR SICK CHILDREN.

Case I.—Male, aged eight months. Bottle-fed. Five weeks before admission there was gradual onset of anorexia, then inclination to cry as if in pain. Head began to sag from side to side, and there was restlessness and free perspiration. Condition on admission: well nourished, child irritable and restless; hypotonia marked in neck muscles, perspiring freely, tips of fingers, palms of hands, and soles of feet bright pink, and tachycardia were present. In four weeks some improvement was noted. Net loss of weight approximately 1 lb. Now normal child doing well. In hospital five weeks. Duration before improvement, nine weeks.

Case II.—Male, aged seven months. Bottle-fed. Five weeks before admission began to cry incessantly, very restless, and cried as if in pain when moved; anorexia was present. Condition on admission: well-nourished infant. Both feet and hands were red and desquamating, and a papulo-vesicular erythematous rash was present on trunk and face; chest showed vesicular breath sounds, while child was per-

spiring freely, and bowels were constipated. Urine showed mild pyuria. Duration in hospital four weeks. Duration before improvement, nine weeks.

Case III.—Female, aged three months. Bottle-fed. Two weeks before admission very irritable, cross, throwing head about, photophobia, and insomnia marked. On admission: child of average nutrition, lying with head retracted and legs extended with very marked photophobia. Anorexia was present as was also a papular eruption on face and trunk. Head retraction and photophobia were so marked that lumbar puncture was performed and the cerebro-spinal fluid found to be normal. Urine showed B. coli and albumen. The course of disease in this case was pyrexial. Total loss of weight 2 lb. Duration in hospital six weeks. Duration before treatment, eight weeks. One week after discharge, readmitted with otitis media, which cleared up in two weeks. Total duration four months. Child now doing well.

Duration of Illness.

In some cases it was not possible to decide the precise date of onset, but the duration has been determined from the first departure from normal noticed by the mother to the date at which the child showed evidence of gaining weight with returning appetite, or, in the two fatal cases, the date of death. The longest duration in the series was five months, and the shortest three weeks, the average being two months. Longer duration has been noted by others, up to ten months; while Feer points out in his cases it was found that the older the child at the onset the longer the disease lasted.

Prognosis.

The prognosis is generally accepted as being favourable except in those cases with marked respiratory symptoms which are liable to develop broncho-pneumonia and prove fatal owing to the fact that the child is debilitated and unable to resist any secondary infection. In the cases under review two died from broncho-pneumonia, giving a death-rate of ten per cent. Others give mortality as high as twenty-five per cent. Rocaz points out that the average mortality recorded (eight to twelve per cent.) is probably too high, owing to the fact that probably only the severer cases are seen in hospitals or by statisticians, and that many milder cases go unrecognised. Complications recorded in the series were otorrhœa, three cases; whitlow of toes in one case; all the other cases cleared up and resumed the existence of normal children. Other complications described are encephalitis, severe stomatitis going on to noma, gastro-enteritis, and septicæmia.

Differential Diagnosis.

Early in the disease the irritability and photophobia may suggest meningitis or teething. The wasting and anorexia suggests tabes mesenterica. The erythematous rash with peeling of hands may lead to diagnosis of scarlet fever, but in all cases of pink disease the rash is followed by the characteristic pink; while the intense itching might suggest scabies or a toxic dermatitis.

The hypotonia, inability to walk and irritability and accompanying stomatitis may suggest rickets, muscular dystrophy, acute anterior poliomyelitis, epidemic

encephalitis or diphtheretic paralysis, while the pinkness of the extremities associated with coldness makes one think of Raynaud's disease or cardiac disease. However, a careful clinical examination will show a variable combination of the more marked symptoms which make a picture easily recognised as a definite disease syndrome; here one could include Bilderback's mnemonic, "Pain, peeling, prostration, paræsthesia, perspiration, posture, Pink."

Treatment.

This largely consists of treating the symptoms with an understanding of the disease syndrome. In the Belfast Hospital for Sick Children the child is clothed with non-irritating material next the skin, e.g., silk, linen, or cotton, with woollens on top. It is put into a large-size cot with pillows around the sides to prevent bruising when restless, no bed clothes are supplied, but the infant is protected from draughts and bright light by a screen which helps to decrease the photophobia; some writers recommend the use of ruby glass for windows. If very restless, sedatives are given, e.g., bromides, chloral, phenobarbitone, trional or one of the newer barbiturates. The skin condition is treated with lotio calaminæ, zinc oxide, and talc powder and frequent baths, while the feet and hands are kept covered so as to prevent scratching and picking of trunk and extremities. Atropine is recommended to combat the intense perspiration. Maintenance of nourishment is essential and forced feeding may be required as increase in food taken and general improvement appear to occur simultaneously; with regard to this, relaxation of the rules in infant feeding may be allowed, taking as a rule "any reasonable form of nourishment at any time."

Hydrotherapy is a method advocated by some writers; frequent baths and cold sponging appear to relieve the patient considerably, and older children definitely like to immerse their hands in cold water. Some authorities also give extra fluids orally to make up for the fluid lost in perspiration.

Treatment with ultra-violet light and vitamin preparations has been tried, but no outstanding benefit from these lines has been recognised.

Acting on the similarity of animal and human disease syndromes raw liver has been given to cases of pink disease with satisfactory results by Wyllie and Stern, basing their treatment on the fact that Finlay and Stern produced a disease syndrome in rats similar to pink disease, and rapidly cured it by the addition of raw liver to the diet. Braithwaite, on the other hand, states that liver may be definitely harmful, as five of his cases treated thus developed severe diarrhœa and rapidly became much worse.

Another line of treatment is one based on the fact that the blood calcium is raised. Sodium citrate is administered intravenously or intraperitoneally in four per cent. solution, or orally in five- to ten-grain doses; this $Ca_3(PO_4)$ and $CaCO_3$ thus decreasing the amount of calcium absorbed and lowering the blood calcium. This produces an immediate beneficial effect in decreasing the restlessness and irritability of the child, although it has not yet been claimed that the duration of the disease is shortened.

So far, no universal line of treatment has been adopted, owing to the fact that the etiology is indefinite, but good nursing combined with maintenance of nutrition, along with the cooling measures of hydrotherapy and light clothing, appear to be the best routine yet known.

Summary.

An account is given of pink disease, dealing briefly with its history, etiology, symptomatology, prognosis, and treatment, with reference to and quotations from notes of twenty cases from the wards of the Belfast Hospital for Sick Children, 1933-38.

For access to their case records I wish to thank Dr. Rowland Hill and Dr. F. M. B. Allen, and to the latter for his advice and criticism; also to Dr. Muriel Frazer for reading the proofs.

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REVIEW

DIETETICS IN GENERAL PRACTICE. By Leslie Cole, M.A., M.D., F.R.C.P. 1938. London: John Bale Medical Publications, Ltd. Pp. 150. Pocket-Monograph Series. Price 3s.

This book is notable for the inclusion and detailed description of diets which are easily followed, simple, and clearly set out.

The first part of the book deals with intestinal disorders, and shows how simple disorders can be effectively dealt with by proper dieting. Menus of special value to the general practitioner are those suitable for the treatment of the patient suffering from incurable carcinoma—to quote the author, "by giving as full a diet as possible much can be done to prolong life and activity and lessen the misery which results from profound weakness and under-nutrition." In dealing with the treatment of gastric and duodenal ulcers, there is a full graduated course of diets, including a description of the Meulengracht treatment of hæmatemesis.

The second part deals with diets suitable for treatment of genito-urinary disorders, metabolic disorders, cardio-vascular disease, etc. The chapter on "Diseases of the Kidney" is well written, and the aim of the diets here is "to relieve the organ of all unnecessary strain and at the same time to give a diet which is sufficient both for recovery and as a high standard of general health as possible."

The general practitioner will find this small book useful not only for refreshing his memory on the dietary treatment of disease, but also for the clearly set out diets which his patients could easily follow and understand.